THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

EDITED BY WATSON DAVIS

ISSUED BY
SCIENCE SERVICE
B and 21st Streets
WASHINGTON, D. C.

EDWIN E. SLOSSON, Director
WATSON DAVIS, Managing Editor

SUBSCRIPTION: $5 A YEAR, POSTPAID

The News-Letter, which is intended for personal, school or club use, is based on Science Service's Daily Science News Bulletin to subscribing newspapers. For this reason, publication of any portion of the News-Letter is strictly prohibited without express permission.

Vol. V. No. 172 Saturday July 26, 1924

DREAMS TO ORDER

By Dr. Edwin E. Slosson.

The interpretation of dreams has been an object of eager interest for more than three thousand years. The latest journals of psycho-analysis deal with the same question as the earliest papyri of Egypt or cuneiform bricks of Assyria--and with little more success.

Isn't it time then that we attacked the problem from th other side? Instead of wasting so much time endeavoring to determine what dreams mean, would we not make better progress if we tried to find out what makes dreams? Then we could get whatever dreams we like and whenever we liked and need not bother about their interpretation.

We now have some prospect of progress in this direction for our new knowledge of the hormones gives us a clue. A case in point is reported by Finley. He had a woman patient to whom he gave a grain a day of extract of the pituitary body to build up her blood pressure. Her dreams had hitherto been trivial and colorless, but after ten days of the treatment she began to have pleasurable and highly colored dreams. She travelled extensively in her dreams, as she had always longed t in reality, and wherever she went she found the stations and cars freshly painted in pleasing colors and the trainmen in nice new uniforms with gold braid.

Shortly after the treatment was altered and adrenalin, another of the glandular secretions, was substituted. At once a change came over the spirit of her dreams. They lost their colors and became horrible, filled with violent quarrels.

Now if a Freudian practitioner had taken the case, he would have proceeded to prote for complexes in her unconscious without even putting her under an anesthetic. He would diagnose the former dreams as due to "suppressed desires", instead of pituitrin, and the latter as due to "infantile fears", instead of adrenalin. Yet the doctor could produce either brand of dreams at will by an infinitesimal dose of white powder.

Fear and rage promote the secretion of adrenalin from the suprarenal glands. Conversely, the injection of adrenalin, which may be made in the laboratory, will stimulate the symptoms of fear, the goose-pimples, the hair-raising, the cold-sweat, and all that. And James showed years ago that with the symptoms come the corresponding emotion.

It seems from this case that dreams may be made to order like picture post-cards, one cent plain and five cents colored. Common dreams come plain in black and white and grey, chiefly grey. Most of us are colorblind for a third of our

lives. My dreams are usually fragmentary and fugitive, shadowy and colorless. But once when I took laudanum there was unveiled before me a series of the most wonderful pictures, minute and sharp as the landscape seen through the big end of an opera-glass, and as brilliantly colored as a Chinese rice-paper sketch. It was an unprecedented experience for me and I realized for the first time what delight are enjoyed by the favored few who have colored dreams naturally.

De Quincey in his "Confessions" and Baudelaire in his "Hymn to Opium" depict in the most glowing terms that English and French afford the delights of the opium dream. But those who seek an artificial paradise by way of the alkaloids find ultimately that they have jumped out of ennui into anguish. De Quincey soon found himself chased by Chinese, kissed by cancerous crocodiles, and suffering oth forms of alliterative torment.

Opium and hashish in the Orient, alcohol and cocain in the Occident, have been from time immemorial the favorite means of escaping from this dull world into the dreamland of Euphoria. Hashish also intensifies color perception and excites chromatic dreams. I knew a lady who was accustomed to take a pinhead pill of hashish gum before going to the theater because it brightened the scenes and converted the painted back-drop into a spacious landscape.

The internally secreted hormones are similar in potency and effect to the externally administered alkaloids. An overdose of insulin, a hormone secreted by the pancreas, causes feelings of "causeless" fear, followed by trembling and finally collapse. The patient can recover his courage by sucking a stick of candy. An excess of activity on the part of the thyroid gland excites anxiety and irritability.

Possibly anxiety and terror dreams in general may be caused by some disturbance in the balance of the hormones or similar organic derangement rather than by anything peculiarly unpleasant in one's past experiences or present predicament.

Certain foods are reputed to produce bad dreams, but this is uncertain. I have often been warned against eating mince pie or Welsh rabbit before bedtime, but when I tried the experiment I saw neither hair nor hoof of a nightmare. Nobody ever told me of any foods that would give pleasant dreams. I wonder why. Aren't there any? But some day the chemist may give us synthetic dreams by his synthetic compounds and then shall our sleep always be happy and the nightmare shall be no more.

READING REFERENCE - Harrow, Benjamin. Glands in Health and Disease. New York, E. P. Dutton & Co., 1922.

TO TEST ARTIFICIAL KIDNEY ON HUMAN BEING

An artificial kidney invented by Dr. John J. Abel, professor of pharmacology at the Medical School of Johns Hopkins University, is shortly to be tested on human beings according to word received by him from a German scientist. Before Dr. Abel's discovery could be applied at the Johns Hopkins Hospital the war broke out and disorganized the source of supply of hirudin, an extract from Hungarian leeches necessarty to the operation of the artificial kidney.

Dr. Abel's researches resulted in the discovery of the pure principle of adrenalin and recently he and his collaborators, Drs. Chas. A. Rouiller and E.M.K. Geiling, have isolated a very powerfully acting hormone from the pituitary gland, an organ controlling the functions of growth.

To the uninitiated eye the artificial kidney looks very much as though it had been built after the general design of a steam boiler but in reality it is made in imitation of the filtering mechanism in the kidneys of higher animals which is known as the glomerulus. On the interior of the artificial kidney are tubes of celloidin, a substance that lets the impurities and poisons strain through but retains in the blood the vital corpuscles and proteins. The leech extract, hirudin, is used to keep the blood from clotting as it flows through the tubes.

The apparatus is attached outside the body to an artery and the blood flows back again to another connection further along on the artery or to a vein. Any filterable constituent of the blood which must not be removed, such as blood sugar, is prevented from escaping through the walls of the celloidin tubes by the fact that they are submerged in a solution that contains the same amount of this substance as the blood.

Already the kidney has been tested on dogs with the result that it was found to operate so rapidly and efficiently that the living kidneys did not secrete and were relieved of their work so they could rest. Thehope of applying it to the relief of human sufferings lies chiefly in the field of cases where the kidneys break down in fatal cases as in acute nephritis, scarlet fever, corrosive sublimate poisoning and similar toxic states. In many instances the life of the patient probably could be saved if his inflamed kidneys were given a few hours rest each day by artificial means.

RAILROAD WHISTLES MAKE CROSSINGS MORE DANGEROUS

Crossings are rendered deadly and millions of dollars worth of steam are wasted annually by whistles now used on leading railroads in this country, Prof. Arthur L. Foley of Indiana University has reported to the Indiana Academy of Science . Changing the location of the whistles on the engine and raising their pitch were advocated to save lives and money.

Whistles are placed behind the smoke stack and dome for convenience only, with no thought of the possible connection between the whistle's location and its efficiency in doing the only thing it is expected to do - to make as much noise as possible along the track ahead of the locomotive, and as little as possible in the directions where it is not only not needed but is usually a nuisance, Professor Foley said, in pointing out that the whistle should be placed in front of the smokestack and have a reflector behind it.

Every time the ordinary locomotive whistle is blown it uses the steam produced by two pounds of coal and he estimates that the ordinary locomotive wastes 36 pounds of coal and 140 pounds of water per hour in whistling. As there are 65,000 locomotives on Class A railroads alone, the cost of blowing whistles runs into millions.

Most of these whistles, Prof. Foley claimed, are from one to two octaves too low in pitch to be heard to the best advantage by the average ear. Raising the

pitch would mean smaller whistles and less steam consumption.

"It is a matter of common observation," he continued, "that locomotive whistle on differeent roads, and frequently on the same road, differ greatly in pitch and in quality. When one hears a whistle, frequently he can not tell whether it is a locomotive whistle or a factory whistle. He becomes so accustomed to hearing such sounds that they may call forth no mental reaction whatever. If all locomotive and traction car whistles were of one pitch and others were prohibited from using whistles of that or near that pitch, the human ear would soon come to recognize that tone and instinctively associate it with danger. Not only this, but the volume of sound required to produce a mental stimulus would be greatly lessened."

NOISES CHANGED INTO MUSIC WHEN BORKEN UP BY TREES

Stories of fairy music in the forest, of haunted waterfalls, and mermaids singing near the seashore, long thought mere figments of the imagination, may have a sound basis in fact. In "Science", Dr. Alexander Forbes of the Harvard Medical School reports numerous cases in which trees seem to have separated discordant shouts and noises and given back echoes in musical tones.

"In every case," he says, "the source of the sound - waves on a beach, roar of a river, exhaust of motor boat or discordant human voices - was one in which many pitches were present. Something in the surroundings, usually trees, must have separated the sounds according to pitch, placing those of one pitch in one place and those of another pitch elsewhere. In this respect the phenomenon appears amalogous to that of white light being broken up into pure spectral colors by a prism."

This reflection or absorption of sound waves of different pitches, Dr. Forbes explains, is only rarely observed. Sometimes the phenomenon is distinct and clear in one spot, yet a few paces backward or forward only the ordinary noises are heard.

The frequent association of trees with these musical echoes is thought to be due to lack of uniformity they present as a reflecting surface for the sounds. Each tree apparently sends back part of the sound, and this reflection is broken up into innumerable parts on account of the varying element of distance.

READING REFERENCE - Miller Dayton C. The Science of Musical Sounds. New York, Macmillan Company, 1922.

French engineers are adopting an American invention, and building engines to operate with mercury vapor instead of with steam.

An apparently practical plan has been developed to use the tidal power of the Severn river of England and Wales at a cost of 30,000,000 pounds sterling.

ARE "WHITE INDIANS" ALBINOS OR A SEPARATE RACE?

So very little is known of the working of the laws of heredity among albinos that an opportunity to study a whole community of thse strange human beings is exceedingly alluring to anthropologists. Dr. Clark Wissler, curator of anthropology of the American Museum of Natural History, says that the colonies of "White Indians", disoovered along a tributary of the Chucunaque River in Panama by the Richard O. Marsh expedition, should prove to be a sort of laboratory.

Dr. Wissler inclines to the opinion that albinism will account for these human puzzles, who recently aroused keen interest in New York City. Other anthropologists, however, point out that albinsim would not explain the fact that they are round-headed, large-headed and large-boned, unlike other Indians of the San Blas tribes. Indeed, this is the one inexplicable thing about the new arrivals. Their skeletal peculiarities have led to many ingenious attempts to supply them with a history.

All the anthropologists agree that they cannot be half-breeds. The crossing of dark with light races results in a smooth-toned skin, of whatever shade, and not in "this inhuman complexion", as Dr. Wissler calls it. To compare these white Indians with Swedes or other northern races is most unobservant , since the latter have ruddy and pronounced coloring, not a spectral pallor.

What, then, are the other possibilities? First, that they may be a separate and ancient race. Of this the anthropologists are skeptical. They recall, however, that in Central America as in Mexico the legend of a "white redeemer" who once dwelt among the people and would some day return, is common. Also it must be remembered that "white Indians"are the subject of old and authoritative mention. They have existed in the Zuni pueblo as far back as the records go. Columbus wrote of seeing white people in Darien. Von Humboldt related that they were to be found in Panama.

Circumstances might well have favored the development of an albino race. That is the second possiblity, and the one best supported by known facts. The white Indians have always been ostracized by their San Blas neighbors, who fear racial contamination and drive them off into the jungle. The enforced segregation might easily have perpetuated albino traits. But then the skeletal differences remain to be accounted for. They also mar the third possibility, suggested by a scientist who has studied native African races - that these white Indians may be affected by a disease which prevents the nerves from supplying coloring matter (melanin) to the skin, hair and iris of the eyes.

"The ordinary traveler, encountering this strange people, is apt to dismiss their coloring as 'mixed blood'. Examination shows, however, that the white Indians belong to a distinct hereditary type," says Dr. Wissler. They do not show a mixture of white and Indian traits, as do other half-breeds, but a white skin unlike the white man's, and decidedly puzzling bones.

Should the albino hypothesis hold, the village of more than a hundred white Indians which some members of the Marsh expedition visited will probably attract eager anthropoligists who have never before had enough human albinos to observe.

Some plants contain a substance which regulates their use of sugar in much the same way as insulin does in man and higher animals.

CHILDREN WITHOUT BROTHERS AND SISTERS FOUND TO BE BRAINIER

Do not pity the only child. He has more brains than children with many brothers and sisters, according to conclusions reached by Dr. Hornell Hart as a result of a study of 600 families in a typical Iowa city. The results have just been reported to the Iowa Child Welfare Research Station at Iowa City.

Children from large families are handicapped mentally, morally, and socially, Dr. Hart declares.

In a representative sample of children from practically completed families in Davenport, Iowa, the ability of the children as determined by mental tests was found generally to run higher the fewer the number of surviving children. Children with no living brothers or sisters tend to have mental test quotients about fiftee points higher than children with eleven living brothers and sisters, and the average mental test ability decreases fairly steadily as the size of the families increases.

"School progress, in excess or defect of the amount to be expected from mental test ability, is at a maximum in families of four or five living children, and at a minimum in families of ten children or over," Dr. Hart says. "The difference between the progress inschool of these two groups is such that the average child in the very large family loses about one-third of a year through conditions other than mental test ability associated with large families.

"The larger the family the greater the tendency is for the children to leave school at the earliest possible age.

"Of families with seven or more living children, fourteen per cent. are chronically dependent, as compared with three per cent. among families with six children or less.

"As far as can be ascertained from teachers' ratings, children in large families are less energetic, less kind, less sincere, and less honest than children from small families. This conclusion is fairly certain for energy, but not so decisive for the other characteristics.

"Contrary to general impression, children without brothers and sisters compare very favorably with children having brothers or sisters. Birth order, as far as it was studied in this inquiry, appears to have bery little significance."

FRENCH USE WIND TO CUT COAL BILL

French engineers are planning extensive plants of windmills to relieve the country of its heavy burden of payment for imported coal. The Eiffel tower in Paris has been employed for experiments on the best means for the utilization of wind power and from these results a form of windmill has been devised which is very different from those in use elsewhere, and, according to the calculations of Lapresle, much more efficient and economical than the American and Dutch types. Our windmills are from 8 to 16 feet across and have 18 or more blades. The new French type has only two blades but these are made much longer. The plans contemplate windmills with two blades revolving in a circle 100 or 130 feet in diameter

In the last number of the French scientific journal, LaNature, Constantin,

leader of the syndicate of engineers who have been studying the question of wind power since 1907, calculates that the hundred-foot windmill in a 13 mile wind will give 50 horse-power, and the 130 foot windmill will give 90 horse-power. With a wind of 22 milesan hour the smaller wheel will give 240 and the larger 400 horse-power.

Constantin proposes to install a series of 130 foot windmills on Mont Ventoux, five thousand feet above the sea, and figures out that a single machine would deliver an average of over 700 horse-power throughout the year. The velocity at the extremity of the blades in the fastest wind would still not be more than half that of the blades of an airplane propeller, so there would be no danger of their flying off.

The wheel is to be connected directly with a dynamo to convert the rotary motion into electrical current and do away with gearing, cranks, or cables. The dynamo is encased in a light shell constructed on stream lines like a fish, so as to offer the least resistance to the wind. The wheel and dynamo turn on a common axis as the wind shifts.

A row of a dozen or more such windmills are to be connected with an "aeolian central" where the varying currents are brought together and transformed into a single current of constant intensity that goes out to the consumers. The surplus electricity at hours when the demand is slight is to be used in electric boilers in making steam, which may be stored in accumulators to be used as needed for heating or power.

It is anticipated that the power thus derived from the wasted energy of the air may serve to warm houses, run shops, drive shop machinery, heat metallurgical furnaces, and run trains. It is also planned to use windpower to propel vessels against the wind. Constantin and Joessel equipped a five ton boat, the Bois-Rose, with a thirty foot air screw, connected with a fory-two inch marine propeller, and navigated this vessel on the Seine at Paris in all directions without disturbing the ordinary traffic. The vessel made about four and a half miles an hour in the face of a fifteen mile wind.

ARMY WORM PLAGUE CHECKED

The outbreak of the army worm in Illinois has been brought under control, according to Prof. George A. Dean of the U. S. Department of Agriculture, who declared that the pest will not prove as damaging as was feared, not reaching the extent or severity of the attack ten years ago. A similar outbreak in Iowa is reported to have been checked before it got well under way.

This caterpillar of an insignificant moth or "miller" has been represented as moving very rapidly over several counties when in full action. An army worm has been known, according to Professor Dean, to cross an 80 acre field, a distance of one fourth of a mile, in 24 hours, which may be regarded as rapid for a caterpillar. But as the length of life of an army worm is from seven to ten days depending upon the temperature, the distance an "army" can travel is limited. The distance a worm army travels depends largely upon the amount of food it finds. If, upon emerging from the eggs, the worms find only a thin covering of vegetation, the urge of hunger will compel migration and they will turn to grasses, young wheat, alfalfa, and other tender plants. If there is sufficient food to carry them through the worm or caterpillar stage, they travel no farther.

The rapidity with which a field may be devoured is surprising. Professor Dear recalled a farmer who woke to find his six acre potato field of the night before a barren waste. There are many records of fields of wheat, corn, and alfalfa disappearing between sunrise and sunset.

The worms undergo metamorphosis in the ground or under such shelter as they can find. The moths then emerge and fly considerable distances, and by laying thei eggs, prepare the way for another army worm outbreak. An army worm attack seems sudden because the extremely small young eat comparatively little and remain near the ground. With increasing size their appetite grows rapidly and their migratory search for food suddenly reveals their presence.

Over the fields occupied by army worms there may be a bee-like buzzing of flie and insects seeking to prey upon the worms. Flocks of blackbirds may appear, and the concerted attack of these and other natural enemies such as insects, toads, and mice , explain the practical elimination of the pest. The farmer can assist by watching for the first appearance of the worm and spraying the fields in which they appear, and scattering poisoned bait. He can protect himself from invasion by plowing a furrow and through this furrow dragging a log to crush the worms as they fall in, or burning with kerosene. An infestedfield should be plowed to destroy the young worms and pupae that may be wintering there.

The last attack preceding the current army worm attack in Illinois and Iowa occurred in each case ten years ago. The cold backward spring caused entomologists to expect the present attack.

The true army worm is distributed over practically the whole United States east of the Rocky Mountains. It does its chief damage in the grain and forage areas of the central Mississippi valley.

The Fall Army Worm of the south has similar habits, but is more local in its attacks. Still another species occurs in the western Mississippi River Valley.

READING REFERENCE - Caldwell, Otis W. and Slosson, Edwin E. Science Remaking the World. New York, Doubleday, Page and Company, 1923.

MAY CROSS COTTON PLANT WITH BIG HAWAIIAN TREE

Cultivated cotton may be crossed with a tree just rescued from complete extinction in Hawaii to make bigger cotton plants and take the kinks from the backs of cotton pickers. Such is the possibilityforeseen as a result of the announcement of the success obtained at the Department of Agriculture's Plant Introduction Garden at Miami, Fla., in growing Kokia Drynarioides from seed. There is only one other tree of this species in existence and that is the one from which the seed were obtained. It is a close relative to the cotton plant, and it has been suggested may be of value for crossing with the cultivated cotton.

But this cotton cousin bears about the same relation to the cultivated varieties as the famous beans Jack bought do to the ordinary garden kind; for Kokia drynarioides reaches 15 to 25 feet in height with a trunk of six inches or more in thickness.

Itwill take a few years, however, to get specimens in cultivation. The experts now pin their hopes on getting more seed from the only parent tree at Kaluluwai. Even if crossing does not succeed, the experts say, this cotton tree will prove an attractive ornamental plant as it has long-stemmed, heart-shaped leaves, and bright-red silky flowers.

HEATED NESTS WITH BATHS BUILT BY PARK BLUEBIRDS

Steam-heated nest with steam baths are being used by a pair of bluebirds in Yellowstone Park, according to reports from the National Park Service. The happy couple have, however, avoided expensive modern plumbing and steam fittings. They have simply taken over one of Nature's big steam plants by constructing their cozy home in the nearly extinct Excelsior geyser crater. Every morning they can be see darting in and out of the steam.

Plants are also using the geyser as a natural greenhouse. Wild strawberries have been found growing not far from the crater two weeks ahead of their usual season.

SAND-PAPER LITHOGRAPHER INVENTED BY ARTIST

A new method of lithographing which will be of special interest to amateur artists and school children has been invented by Norman Jacobson, of Coketown, Wyoming, now studying art in Paris. In his method, sand-paper replaces the expensive stones hitherto necessary. Some brilliant effects can even be obtained by using as "printing-press" the family wash wringer.

The idea of sand-paper lithographs came accidentally when the young American etcher happened to run an ink-roller over a piece of sand-paper. He noticed that the sand-paper would not "take" ink. He found that if he draw a design on it with wax-crayons or a pointed piece of soap and then inked the sand-paper, the design was printed not unlike that from a regular lithographing stone. A group of American art students are now turning out work by the new method.

Mr. Jacobson says that the method will be of special value in schools as it opens up a new art which can be practiced without expensive equipment. The negatives need not necessarily be drawn. If letters or silhouette pictures are cut out of a newspaper or magazine and pasted on a sheet of sand-paper, then inked and run through an ordinary wringer with a sheet of blank paper, a copy of the design is printed on the paper. Many copies may be printed as the sand-paper negative does not easily wear out.

TALKING ACROSS ATLANTIC MAY BE MADE MUCH CHEAPER

Talking across the Atlantic by radio telephony has been as accomplished fact for nearly ten years - possible, but altogether too expensive for the average American girl who might desire to while away a dull evening by a little flirtation with the Princeof Wales.

Just now it is still in the experimental stage, but there are hopes. Already

radio engineers working in cooperation under the direction of the American Telephor and Telegraph Co., the Radio Corporation of America, and the Western Electric Co., have succeeded in devising a method which saves two thirds of the power required. When the enormous quantities of high frequency power required for transoceanic telephony are considered it is obvious how much the saving may mean towards making such conversations commercially practicable.

In the ordinary telegraphic transmission three bands of electric waves are transmitted through the ether. These experimenters, according to an announcement to be made by the Engineering Foundation, have evolved a method requiring only one band which makes all the power radiated effective in transmitting the message, while by the ordinary method most of this power is not thus effective. Wave length space in the ether also is conserved and the transmitting antenna problem simplified.

Conservation of frequency range is most important when it is realized that the total range available is distinctly limited. The upper limit for radio telephony may be 60,000 cycles a second. Below 30,000 cycles the range is preempted by transoceanic telegraphy.

TABLOID BOOK REVIEW

PSYCHOLOGICAL TESTS IN BUSINESS. By A. W. Kornhauser and F. A. Kingsbury. Published by The University of Chicago Press, Chicago, Illinois. Price, $1.90.

Psychology is being applied to business. In this book the psychologists state the basis facts about test methods and test accomplishments in the field of business. It is not a handbook of tests that can be used in business; in fact, it does not contain a single psychological test. The authors hold that tests are scientific instruments and not patent madicines. Special aptitude tests have proved useful in the selection of telegraphers, telephone operators, street-car motor-men, journalists, aviators, musicians and intelligance tests have been used with some measure of success among policemen, waitresses and engineering students.

FOSSIL ELEPHANTS FOUND IN SWAMPS OF MINNESOTA

When the swamp areas of northern Minnesota are drained, remains of many elephant may be brought to light, Prof. Clinton R. Stauffer of the University of Minnesota has reported to "Science" that recent finds indicate that huge mastodons and mammoths were once abundant in that region and survived the great ice age formerly thought to be the period in which they became extinct.

An atom is mostly empty space for the electrons that make up its substance are like flies in a cathedral compared to the size of the atom.

Blocks of rubber are being used in automobile construction to eliminate sudden shocks, noise, and the necessity for lubrication at various points in the chassis.